



AMPEX

*The ultimate in
analog video
recording for post-
production and
broadcast.*



THE VPR-3: HI-TECH PROBLEM SOLVER

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hough the Emmy Award winning VPR-3 is a marvel of technical achievement, the most significant achievement of the VPR-3 is what it can accomplish for you, especially in the areas of editing, animation and program compression.

TURBO (Real-time) Animation

The VPR-3's speed and accuracy allows it to do animation in a play-speed, real-time relationship. Unlike stationary mode recording, the VPR-3 does not require the complex (and often picture-degrading) pre-processing of the video signal to rearrange the video frequencies before recording. The VPR-3's play-speed recording is purely a video edit. With an 18 frame pre-roll, 3 frame post-roll and a re-cue, the VPR-3 can accomplish a 6 frame animation sequence in only 1.6 seconds (required for 1 cell) plus only a tenth of a second longer to complete the remaining 5 frames!

For The First Time, *True* Auto-Assembly With *Field* Accuracy.

The combination of a 20 milli-second lock-up time, 500 inches/sec² acceleration, and speed transitions comparable to disk devices allows a 30 second spot to be recued-to-play in less than two seconds.

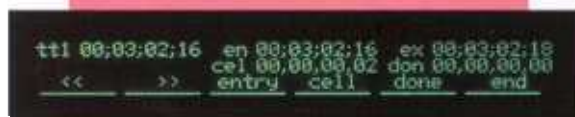
The VPR-3 brings to editing the super-fast speeds required for uninterrupted recording of source material. You can perform single-field edits from the front panel or from the serial port. (The VPR-3 is the *only* VTR capable of searching to a field). Edits will be dead-accurate because a built-in Sc/H circuit gives the VTR immediate comparison between the input and the off-tape signal phasing, thereby ensuring perfect frame edits. The time consuming process of test edits, adjustments, and re-edits becomes a thing of the past.

When there is a mismatch between input and off-tape signals, the VPR-3's Sc/H *phasing control* allows the operator to apply an offset for correction. (And to make editing even easier, an indicator just above the Sc/H meter shows the operator that a wrong frame edit is being attempted).

The VPR-3's machine-to-machine editing capability from a single machine control panel eliminates the requirement for an expensive external edit controller in many facilities. The combination of the full-time synchronized transport and the SMPTE communication bus is the basis for this exclusive feature. Even the most complex split edits can be previewed, trimmed, shifted, performed and then reviewed using only the simple, single-function controls on the record VPR-3.



*TURBO (Real-time)
Animation*



*Animation status is available
at a glance from a menu that
reads out in English.*

ZEUS™ Video Processing

Now the ultimate in VTRs has the ultimate video processor as a companion. Integrated with the VPR-3, the Emmy Award winning ZEUS Advanced Video Processor provides revolutionary improvements in the quality and production flexibility of videotape recording.

Production and post-production facilities will especially appreciate the superb video processing and greater creative video control capabilities of the ZEUS. Its unique ability to extend practical multi-generation limits of Type C recording improves their product, and saves time and money.

Key Features Of ZEUS Processing

- ☐ No compromise 4Fsc, 9-bit digital system
- ☐ Drift and adjustment-free velocity compensation dramatically improves compensation accuracy and multi-generation video performance
- ☐ Exclusive frame averaging velocity compensator function reduces head impact error visibility
- ☐ Superior spatial-averaging dropout compensation
- ☐ Exclusive Multi-Gen Setup mode greatly improves multi-generation video performance
- ☐ Unique Decode mode allows replay of non-color framed edits with no picture shift
- ☐ Video time compression and expansion with no picture bounce or blur
- ☐ Full frame storage on command
- ☐ Comprehensive interface with VPR-3 menu control system
- ☐ Available full-function serial remote control panel



Zeus™, a fully digital video signal processor, is integral to the VPR-3

sequence that quickly duplicates 10 tape generations. This 10-generation sequence is continuously repeated, so that errors are clearly displayed, and can be quickly corrected by proper system adjustment.

Multi-Gen Setup supports an increase in both the number of tape generations routinely used, and the quality of the finished video product.

Multi-Gen Setup

The VPR-3/ZEUS Multi-Gen Setup mode helps eliminate operational setup errors—a major contributor to multi-generation performance degradation.

Multi-Gen Setup is accomplished through a series of play-record-play-record recirculations through the VPR-3 and Zeus processor. From pre-recorded 1st generation reference material (i.e., color bars) the VPR-3/Zeus system generates and displays, in real-time, a

Audio Quality That Rivals Professional Audio Decks

The VPR-3's audio system provides phase compensated electronics to improve stereo broadcast performance, and automatic computer set-up of all record parameters by means of a built-in audio test oscillator, audio distortion, analyzer, and digital voltmeter. This allows quick optimization for different tape types, and three complete set-ups can be stored for immediate re-call.



A combination of wrong-frame (error warning indicators) and an Sc/H phasing meter that quickly compares input to off-tape signals gives the operator complete control of the editing process.

FROM AMPEX ENGINEERING EXCELLENCE COMES THE FASTEST, MOST ACCURATE, AND GENTLEST VIDEO TAPE RECORDER IN THE WORLD

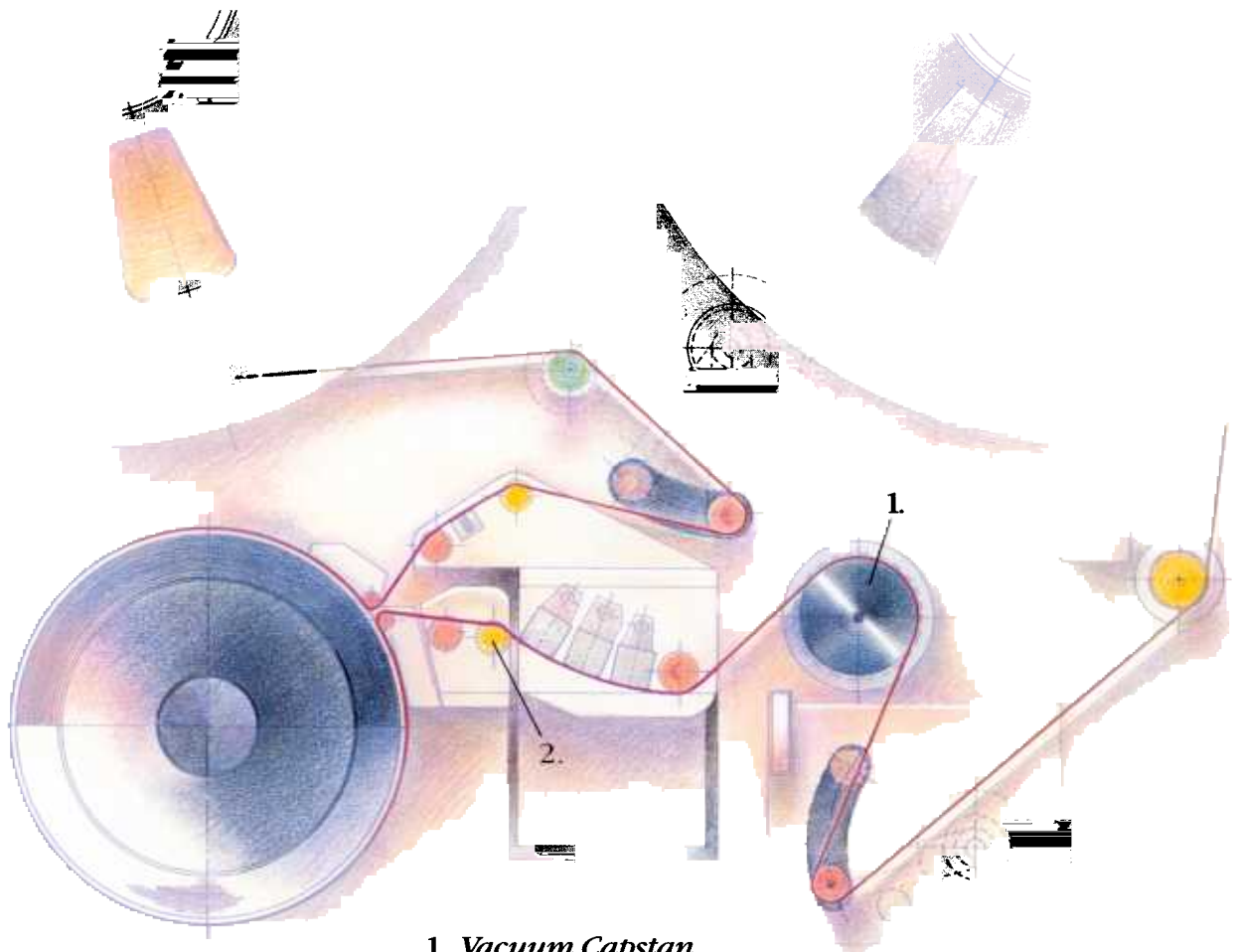
Single-field lock-up. 500 inches/sec² acceleration. Tape position accuracy in TV lines, instead of fields. Tape tension differences reduced from the typical 300-400%, to 4-5%: Easy to say, difficult to do—so difficult that the VPR-3 stands alone in the industry at this performance level.

Vacuum Capstan With High Resolution Tachometer

The precision-ground vacuum capstan is directly coupled to a low inertia, high torque DC motor assembly. This system allows the tape to be controlled from zero to $\pm 50\times$ play speed in a single function without tape stretch or damage. The optimum tape coupling obtained with vacuum allows the use of a high resolution integral tach instead of a separate, and less

accurate, tape timer assembly.

This ultra-high resolution tachometer is accurate to within 12 television lines, providing parking accuracy superior to all other C-format VTRs. Continuous capstan control of tape motion also permits the use of a coupling servo to adjust capstan acceleration to take advantage of the VPR-3's high torque reel motors.



- 1. *Vacuum Capstan*
- 2. *Flutter Idler*
- *Air Guides*
- *Roller Guides*
- *Fixed Roller Guides*

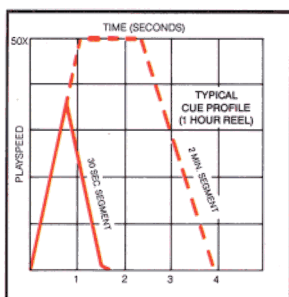
Low Friction Tape Path And Active Guide System

A configuration of gas-film guides at critical locations, plus precision rotary guides, reduces the effects of friction permitting very rapid changes in tape direction, regardless of temperature and humidity conditions, or tape formulations. This low friction, active tape guiding system provides constant tension and allows almost limitless high speed shuttling. It also dramatically reduces head and scanner wear, and allows reel sizes from spot to 3 hours to be used while maintaining gentle and precise tape handling.

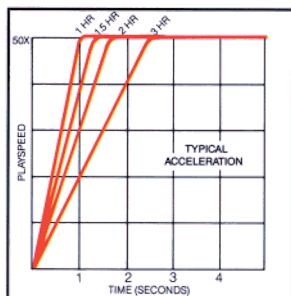


Servoed, Fail-Safe Dynamic Braking

The VPR-3's advanced design completely eliminates the marginally effective mechanical brakes often



The VPR-3's incomparable acceleration allows a 30 second segment to be re-cued and synchronously played in 2 seconds, using one hour reels.



A vacuum capstan directly coupled to a low inertia, high torque motor allows maximum acceleration from zero to $\pm 50 \times$ play speed without tape stretch or damage

used in VTR transport design. In the event of power failure, even at full shuttle speeds, the VPR-3's servo system brings the tape to a smoothly controlled stop, eliminating the possibility of tape damage.



A Unique, Field-Accurate Automatic Scan Tracking (AST™) System

Taking a precision reference from the direct-coupled capstan tachometer, the VPR-3's AST system knows exact tape position under all conditions and applies the necessary correction factors to produce a stable, disturbance-free picture. In the time compression and expansion modes, this system allows speed variations as small as one second per hour (up to $\pm 15\%$) to be entered.



Field Rate Color-Framer

An integral part of the video signal system is a field rate color-framer which determines the precise parking position when the tape transport is stopped. This color-framer is designed to separate one field out of four in the NTSC system or one field out of eight in the PAL system. This permits the machine, even with its "instant" start capability to operate in a fully synchronous mode at all times.



Microprocessor-Based Control

The VPR-3 control system is based on dual Z80 microprocessors. One of these processors is responsible for system control and the second controls the various input/output functions. The dual RS-422A serial communications ports allow control interface of the VPR-3 to a variety of serial machine controllers, including the Ampex ACE series editors and the VRC-2.



POWERFUL, AND OPERATOR FRIENDLY!

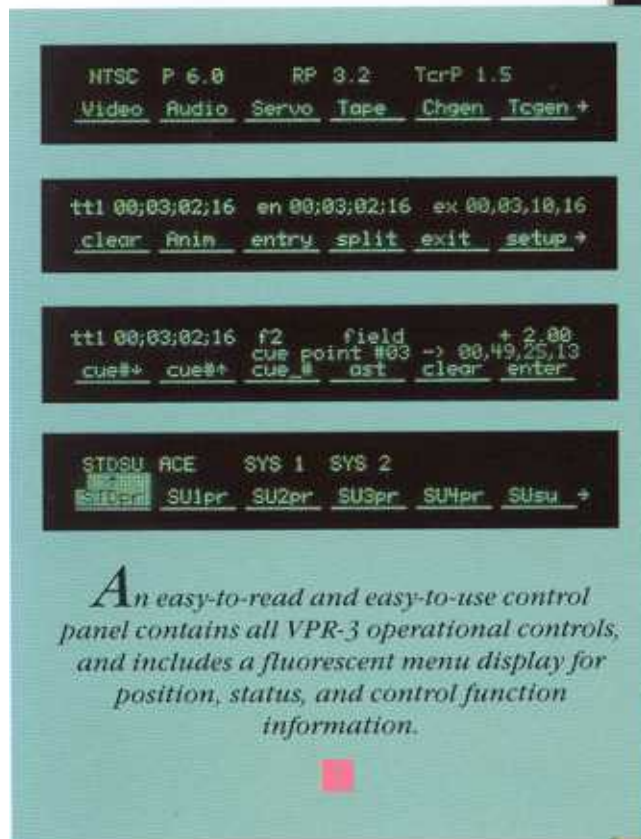
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hen one VTR supports almost anything a user could ever want, regardless of the application, an extremely powerful control system with equally powerful software is necessary to make it easy to use. The control system described on these pages accomplishes just that.

Menu-Based Operational System

The VPR-3's menu-based control system eliminates the tens of dedicated keys that would normally be required to accomplish VTR set-ups, editing function, cueing, animation, etc. This soft key approach maintains the VPR-3's incomparable operational flexibility, while providing an easy-to-learn, fast-to-use control panel that is optimized to your specialized needs.

With the *user set up menu*, you can store all the functions required for any one operation, and then recall them with a single keystroke. A complete operational environment can be created in this way, minimizing the time consumed in major VTR application changes.



Status-At-A-Glance™ Displays

As a further enhancement of the VPR-3's operational interface, its Status-At-A-Glance system provides a summary, one page, English language video character display of all critical VTR operational status pa-

rameters. A second page displays all major ZEUS operational parameters. Either page may be easily selected for display on the VTR video monitor.



One button displays all critical operational status parameters on the video monitor with the VPR-3's unique Status-At-A-Glance™ feature.



FASTER AND EASIER TO SERVICE WITH ADVANCED SELF-DIAGNOSTICS AND FULL-ACCESS ASSEMBLIES

The VPR-3 is as sophisticated as it is versatile and powerful. High performance editing, superb animation and smooth program compression/expansion are supported by the hundreds of circuits, components and assemblies that are required to do the job—with no compromise. So along with this high performance and versatility, Ampex gives you the tools you need for quick, easy servicing.

The *home menu* (and the video monitor) displays fault conditions as well as non-standard conditions, allowing the operator to quickly identify abnormal operational conditions.

Power-up diagnostics check computer buses, power supplies and microprocessors to confirm operational status. Then, *continuous* diagnostics take over to check tape path conditions and all operational environments. The operator is informed if faults are found, and then *board* and *chip level* diagnostics are used to isolate the fault.



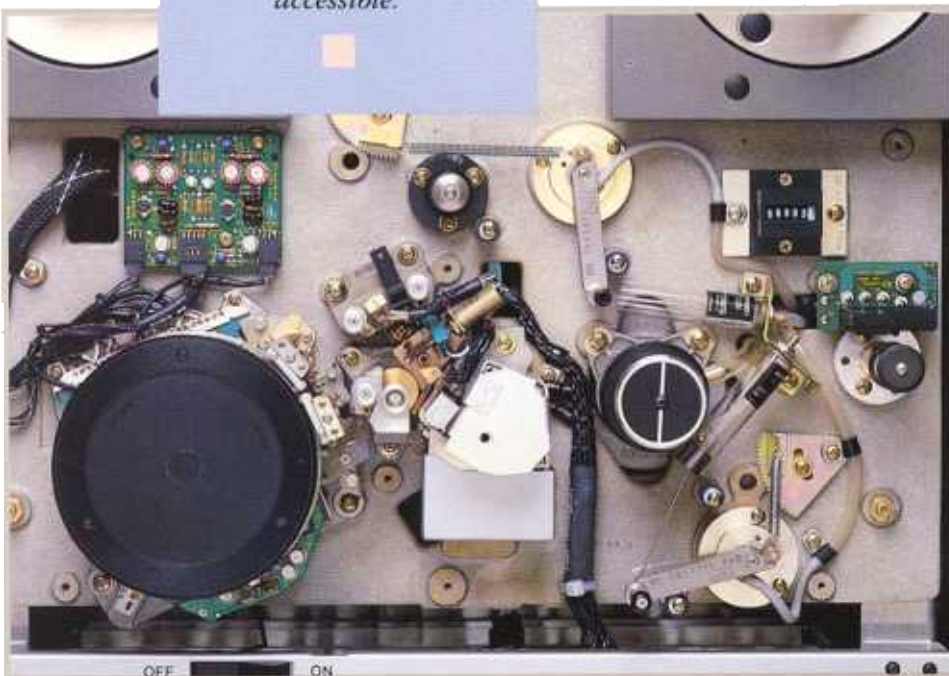
Diagnostic readouts on the video monitor in English tell where the trouble is.

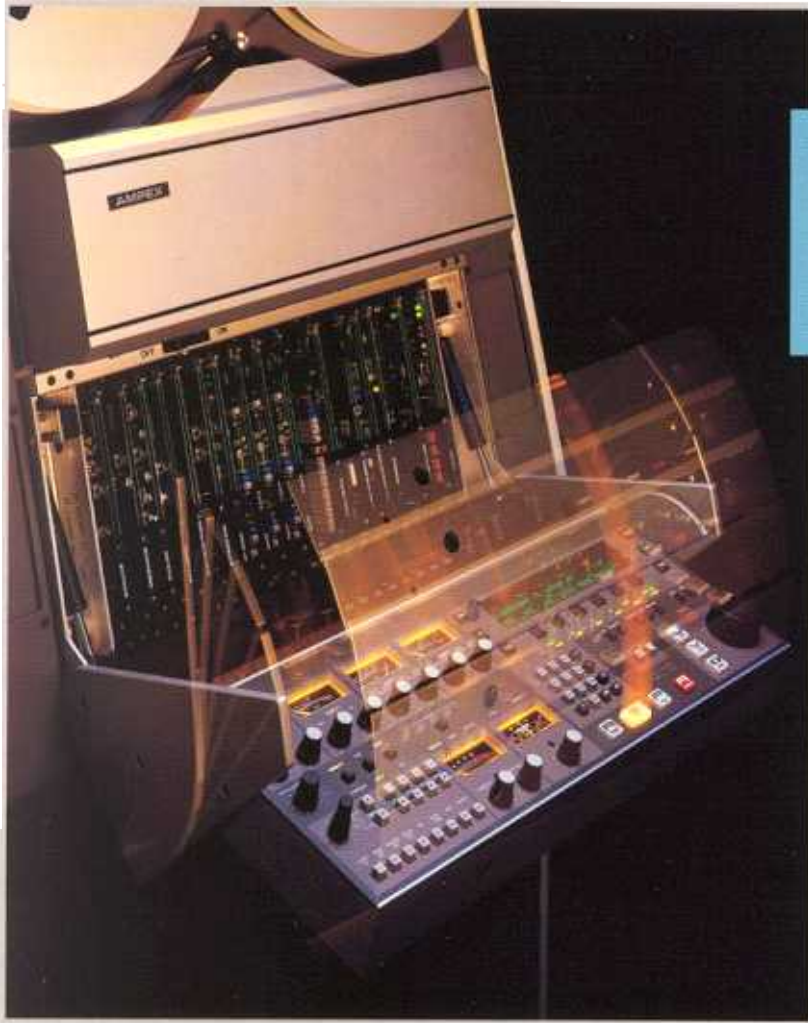
The fastest, most accurate and gentlest tape transport in the world is also rugged and accessible.

```
tcr 01:16:10:08 f2 editor off + 1.00
sys nonstd-clr frm inv
edit stc vso editr diag setup+
```

```
tcr 01:16:04:28 f1 editor off + 1.00
control track absent
edit stc vso editr diag setup+
```

Diagnostic menus specifically inform the operator of errors and faults in the system





Full control panel operation is maintained during access to circuit boards, even when on extenders.

Easy Accessibility

Straightforward access to circuit boards is obtained while maintaining full control panel operation. Most of the VPR-3's circuit boards are located behind a swing-down control panel that quickly moves out of the way for extender board mounting of circuit boards.

Circuit boards plug-in to two mother boards, permitting "instant" board replacement when the diag-

nostics so indicate. All major servo drive and power supply components inside the VPR-3 are located on plug-in assemblies for quick replacement or repair. The servo and power supply card bay can be hinged down for easy access to the rear of the tape transport and the internal air/vacuum system.

Optional Accessories

A number of accessories and options are available from Ampex to expand the operational capabilities of the VPR-3. These may be purchased with the machine, or added later as operational needs change. They include:

☐ Sync Channel

An option to permit all vertical sync information to be recorded according to the SMPTE/EBU Type C formats.

☐ Four Channel Audio

This EBU option provides a fourth high quality audio channel in the track space normally allotted to the sync channel.

☐ Mounting Configurations

The VPR-3 is available in a variety of physical configurations to suit individual facility requirements.

SPECIFICATIONS

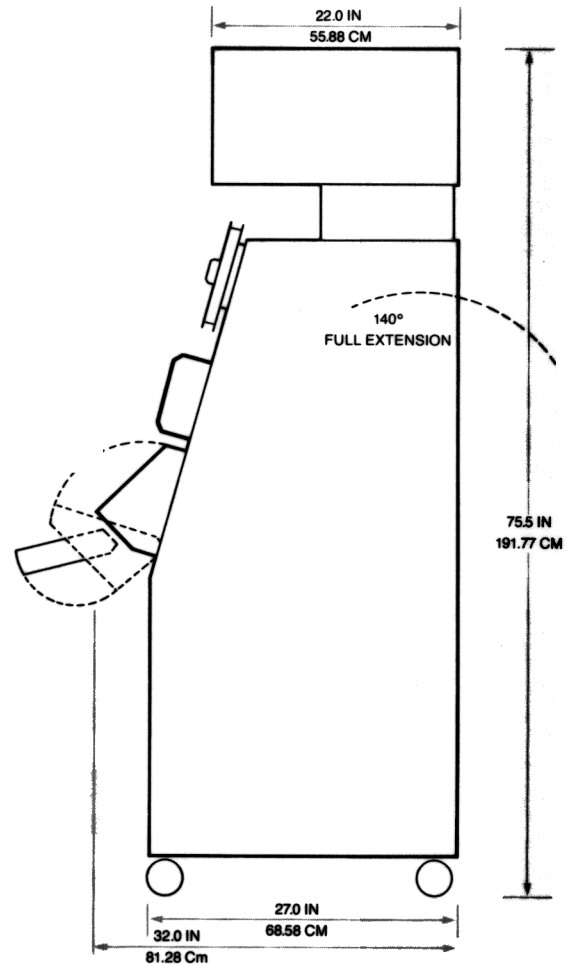
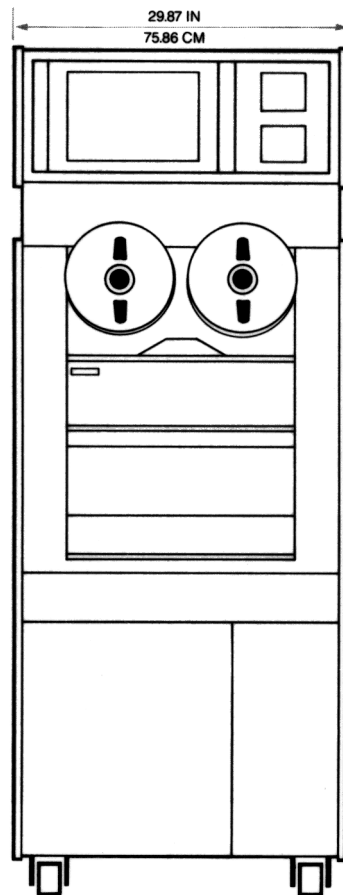
VIDEO AND SYNC	NTSC/PAL-M 525/60	PAL/SECAM 625/50
Bandwidth	Flat to 4.2 MHz \pm 0.5 dB -3 dB at 5.0 MHz	Flat to 5.0 MHz \pm 0.5 dB -3 dB at 6.0 MHz
S/N (IEEE Standard 618-1984) using Zeus	-47 dB peak-to-peak video to RMS noise on interchange basis	-44 dB peak-to-peak video to RMS noise on interchange basis
LF Linearity	2% blanking to white (maximum)	2% blanking to white (maximum)
Differential Gain	4% blanking to white (maximum)	4% blanking to white (maximum)
Differential Phase (40 IEEE units of subcarrier through Zeus)	4° at 3.58 MHz off-tape (max)	4° at 4.43 MHz off-tape (max)
Chrominance/Luminance Delay	20 n sec (maximum)	25 n sec (maximum)
2T sin ² Pulse & Bar	1% K-factor maximum	1% K-factor maximum
Moire	-40 dB color bars 75% amplitude 3.58 MHz subcarrier	-36 dB color bars 75% amplitude 4.43 MHz subcarrier
AUDIO (Channels 1, 2, & 3)		
Frequency Response (400 Hz Ref) 100 nWb/m reference level	\pm 1 dB 200 Hz to 12 KHz \pm 2dB 50 Hz to 18 KHz	
S/N (with respect to 8 dB above reference level) 20 Hz to 20 KHz	-56 dB Audio 1 and 2 -54 DB Audio 3 (Note 1)	-56 dB Audio 1 and 2 -54 dB Audio 3 (Note 1) + Audio 4
Distortion (measured at 1 KHz) (3HD) @ 100 nWb/m reference level (+8 dBm) @ 251 nWb/m peak level (+16 dBm) With predistortion at 200 nWb/m (+14 dBm)	1% maximum 3% maximum 1% maximum	
Depth of erasure on its own recording	-70 dB	
Wow & Flutter	.07% NAB unweighted (flutter tape)	.07% DIN weighted (R/P)
Playback Crosstalk (Audio 1 & 2) 1 KHz referenced to +8 dBm or 100 nWb/m	-60 dB maximum	
SIGNAL INPUTS		
Video Input (75 ohm) BNC	0.5 to 2 volts peak-to-peak	
Ref Video (75 ohm) BNC		
Comp sync	0.7 to 4 volts	
Comp video	0.5 to 2 volts	
Audio line inputs	-24 to +24 dBm, +8 dBm nominal	
Impedance, Transformerless, True Differential	balanced; 65 K ohm resistive	
SIGNAL OUTPUTS		
Video Output (75 ohm) BNC	1.0 Volt peak-to-peak	
Audio Line Outputs, Transformerless, True Differential	+8 dBm nominal; balanced +24 dBm maximum (Note 3)	
Impedance	less than 20 ohms	
Headphone Audio Monitor	0 dBm to drive 600 ohms	
Audio Meter Circuits Switchable VU or PPM		
GENERAL		
Record Time	190 minutes nominal; 9200 feet of tape on 14" reel	
Shuttle Time	less than 72 seconds for 60 minute tape, 3.6 minutes for a 3 hour tape	
Tape-Timer Accuracy (Control track updated)	\pm 0.1 Field with continuous control track	
Tape Speed	244 \pm 0.5 mm/sec 9.606 \pm 0.02 in/sec	239.8 \pm 0.5 mm/sec 9.44 \pm 0.02 in/sec
Video Writing Speed	1009 in/sec nominal	842 in/sec nominal
FM Carrier Frequencies	7.9 MHz blanking 10.0 MHz peak white	7.68 MHz blanking 8.9 MHz peak white
Audio Equalization	15 microseconds 3180 microseconds	15 microseconds
Lock-up time from Ready Mode	20 milliseconds	Lock-up time from Scanner Off 3 seconds

Note 1: Audio 3 channel has wide-band capability for Time Code (S/N WB-30 dB)

Note 2: All specifications are based on Ampex 196 Tape or equivalent.

Note 3: Can be readjusted downward by 12 dBm.

Ampex reserves the right to make product and specification changes at any time without notice.



PHYSICAL DIMENSIONS

	Rack Mount	Table Top	Studio Console w/ Monitor Bridge & TBC
Height	29.75 in. 75.56 cm.	30.5 in. 77.47 cm.	75.5 in. 191.77 cm.
Width	19.0 in. (Note #4) 48.26 cm.	22.0 in. 55.88 cm.	29.87 in. 75.86 cm.
Depth			
Weight	270 lb. 122.47 kg	275 lb. 124.74 kg.	650 lb. 294.84 kg

TEMPERATURE & HUMIDITY

Temperature	0-45°C
Humidity	10%-90% RH (non-condensing)

POWER INPUT

Power Line Frequency	50 & 60 Hz single phase
Input voltages	95/105/115/125/135 Volts AC ± 5% 190/210/230/250/270 Volts AC ± 5%
Input Current (Table Top)	115 vac Nominal 3.5 Amps * 230 vac Nominal 1.8 Amps †
(Lowboy console TBC and color monitor bridge)	115 vac Nominal 14 Amps * 230 vac Nominal 7.0 Amps †

Note 4: +2" Front Mounting Trim & Control Panel
Note 5: Removable Control Panel reduces depth to 27"

* Additional 12 Amp. 1 sec shuttle start surge
† Additional 6 Amp. 1 sec shuttle start surge